Department of Technology Services

Linux Systems Application Hosting

Service Offering Document

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REVISION HISTORY

REVISION	DATE OF RELEASE	PURPOSE
1	September 13, 2004	First release
2	March 8, 2006	Updates to documentation to reflect the consolidation.

Linux Systems Application Hosting

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Explanation of the Service Offering

Statement of Service

Software applications are a vital component of many businesses. Ensuring that these applications are hosted in a reliable, secure, and technologically up-to-date environment is, for many organizations, difficult, expensive, and a drain on technical support staff. The DTS offers extensive, secure processing, monitors computing availability and performance, and provides backup and recovery capabilities.

The DTS provides software application hosting on Linux virtual servers running the SuSE Linux operating system and related distribution, including Apache, MySQL, and PHP. In addition, other supported database products include DB2, Oracle, and Informix. The hardware platform is a logical partition (LPAR) on a reliable, secure IBM 2064 mainframe, which also supports our z/OS platform. Our hardware complex is located in our secure, environmentally controlled raised floor computer room with full power system redundancy and a halon fire suppression system.

Service Offering Highlights

The Linux Systems Application Hosting service includes the following:

- Shared hardware for installation and maintenance of Linux systems (See Pricing, Chapter 7, for server details).
- Server on demand (virtual servers generated without procurements).
- 5 GB of external storage.
- Linux servers may be added or deleted in monthly processing intervals with 30 days advanced notice to the DTS.
- Test and development servers at lower costs (based on CPU cap).
- Shared software for installation and maintenance of Linux systems (operating system, system utilities, Linux utilities, database, and web software).
- Performance monitoring.
- Network connectivity (for customers with existing DTS network connections).
- Environmentally controlled secure facility.
- Reliable power supply with full uninterruptible power supply (UPS) and generator backup.
- Halon fire suppression system.
- System backup and recovery at the z/VM minidisk level.
- Security systems including virus protection, data encryption, and intrusion detection.

Note: The current service offering is only available through the DTS Intranet at this time. However, DTS is working to provide secure Internet access by the end of the 4th quarter, 2004.

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Roles and Responsibilities

DTS Responsibilities

Provide Hardware Procurement and Installation

- Procure mainframe hardware and peripherals as needed.
- Install mainframe hardware and peripherals.

Provide Performance Measurement and Capacity Planning

- Track resource utilization.
- Maintain adequate capacity to support growth in new or existing customer applications.
- Notify the customer of capacity and/or performance issues the DTS discovers.

Provide Linux Server OS Support

- Perform installation and maintenance of Operating System (OS) and related utilities.
- Troubleshoot server hardware and OS.
- Backup and restore the OS and related utilities.

Provide System Database Support

- Perform installation and maintenance of database software.
- Develop and maintain database to OS interfaces.
- Provide database troubleshooting.
- Provide application data restoration and recovery.

Provide Enterprise Storage Support

- Provide installation and maintenance of storage subsystem.
- Provide installation and maintenance of enterprise storage backup solutions.
- Provide storage system troubleshooting.

Provide Network Connectivity

- Establish connectivity from servers to an existing DTS /customer network.
- Establish isolated connectivity and firewall protection (purchased separately as part of DTS's network access service offering).

Customer Responsibilities

Provide Linux Server System Administration

- Act as the primary contact for the customer when contact by DTS support staff is needed.
- Participate in development/maintenance of OS to OS interfaces.
- Provide user administration.

Provide Application Database Support

- Act as the primary contact for the customer when contact by DTS support staff is needed.
- Provide database development and support.
- Act as primary application database administrator. More detailed information can be found via this link: http://intranet/overview/isd/technology/database/DB_roles_resps.asp

Provide Application Support

- Provide development and maintenance of the application.
- Provide development and maintenance of the application to all OS interfaces.

Provide System Security Safeguards

- The customer agrees to exercise reasonable efforts to safeguard the following information:
  - Specific version information of the systems' firmware, operating system, and applications in order to minimize the potential exploitation of vulnerabilities. prior to release and application of service packs/fixes.
  - Account names and passwords.
  - IP addresses and system names.

Joint Responsibilities (DTS and customer)

- Provide monitoring and notification on system availability, performance, capacity limitations, and change (including system, network and application changes).
- Provide application data restoration/recovery.
- The DTS and the customer are responsible for ensuring the protection of confidential data stored and transmitted. Additionally, the DTS performs logging and tracking of security events should they occur.
- The DTS and the customer are each responsible for notifying their appropriate security representative (usually the Information Security Officer) of any suspected unauthorized access.
- The DTS and the customer are responsible for maintaining hardware and software at vendor supported levels. Customers are responsible for maintaining application software at the supported levels of the system software. If customers delay in updating application software, additional support costs will be incurred.

Service Offering Customer Startup Checklist

- Submit a completed DTS Service Request.
- Include:
    - Requested availability date.
    - The Linux server category (see Pricing, Chapter 7, for details).
    - Any required products in addition to those listed for the requested server category.
    - Any processor, memory, or disk storage in addition to that listed for the requested server category.

Customer Administration Duties Checklist

- Linux userid administration (addition, change and deletion).
- Application userid administration.
- Linux password administration.
- Application password administration.

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Security

The State of California and the DTS's customers require that the DTS maintain Information Technology (IT) security that protects the entire data center and all of its customers from unauthorized intrusions. Linux System Application Hosting customers are expected to observe the various IT security-related best practices, standards, and policies in force within the DTS including the security guidelines outlined by the International Standards Organization section 17999, available via this link: http://intranet/overview/pandc/security/manual.asp

Customers not in compliance with the DTS's security guidelines subject the DTS and its other customers to unnecessary security risks and consequences. The DTS may take remedial action or discontinue services to Application Hosting customers that disregard the security guidelines. Specific IT security-related guidelines for Application Hosting customers are contained within the Operations and Systems Security section below.

All Linux System Application Hosting customer service requests and project changes must include a review and approval by the customer's Information Security Officer (ISO) and the DTS's ISO.

Operations and Systems Security

Linux Application Hosting customers are responsible for the following IT security areas:

- Maintain up-to-date application patch upgrades.
- Provide an intrusion detection system (IDS) and perform testing as deemed necessary (host IDS or file integrity checking).
- Perform pre-production and subsequent security vulnerability scanning and analysis of hosted applications.
- Adhere to current DTS security guidelines regarding foreign connections into the DTS trusted network. (These practices include, but are not limited to, remote administration, Telnet, and FTP.)

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Getting Help

The DTS Service Desk is staffed 7 days a week, 24 hours a day. The phone number 916-739-7640.

The DTS Service Desk Process

The Service Desk levels are defined as follows:

First Level: Customer end user or Customer Help Desk.
Second Level: The DTS Service Desk.
Third Level: DTS technical support.

If the customer (or customer's help desk, where applicable) determines a problem involves a server or related component at the DTS, a call should be placed to the DTS Service Desk to open an incident ticket. A severity code is assigned to every ticket according to the DTS Severity Code Definitions (see Appendix B).

When an incident ticket is forwarded to the Service Desk queue, the DTS must accept or refer the ticket back to the customer within the timeframes listed in the severity code definitions (see Appendix B). Tickets are referred back to the customer help desk if the problem involves an application, a desktop system, the customer local area network (LAN), a customer network issue, or a remote access issue.

If the DTS Service Desk resolves the incident/problem, they update and close the trouble ticket and notify the customer. If the Service Desk needs further assistance, they escalate the ticket to the DTS third level support by assigning the ticket to the appropriate support group with notification to the customer. The appropriate third level support group is responsible for updating the Service Desk regarding their progress on the incident/problem according to the Severity Code Definitions. The Service Desk passes this information back to the customer.

Once the appropriate third level support group resolves the incident/problem, they update and close the incident ticket and notify the Service Desk. The Service Desk notifies the customer that the incident/problem has been resolved.

If a system problem is initially detected by the DTS, the Service Desk opens an incident ticket and notifies the customer. The resolution process remains the same as described above.

Escalation Process

The following individuals should be contacted in the order they are listed to escalate an incident ticket that has not been satisfactorily resolved:

Rich Hall, Manager, DTS Service Desk	(916) 739-7605
Ray Perkins, Linux Project Manager	(916) 739-7644
Carl Youngren, Manager, Large Systems	(916) 738-7668
Kathy Saito, Deputy Director, Engineering	(916) 739-7650
DTS Customer Delivery Division	(916) 454-7225

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Service Offering Objectives

System Availability

System availability refers to the scheduled daily hours of operation for this service. System availability is divided into three categories: (1) normal hours of operation; (2) off-hours of operation; and (3) planned system outages (Including backup window).

Normal Hours of Operation

Normal hours of operation are Monday through Friday, 7:00 a.m. to 5:00 p.m., excluding holidays.

Off-Hours of Operation

Off-hours of operation are Monday through Friday, 5:00 p.m. to 7:00 a.m. and Saturday, Sunday, and holidays, all day (24 hours).

Planned System Outage – The following are planned system outages:

- System conversions and hardware and software upgrades or replacements;
  - System service is preceded by at least two weeks advance notice to the customer;
  - System changes are tested in a test environment for a minimum of 30 days; and
  - System service is scheduled using the DTS change management process.
- Preventive maintenance is generally performed the first and third Mondays of each month. The DTS publishes a Preventive Maintenance (PM) Schedule via the change management process. PM is designed to provide regular system service with minimal system outage.

- Other maintenance, such as malfunctioning equipment outside of the normal maintenance schedule, is performed at mutually agreed-upon times with the customer.
- System backups are usually run nightly between 12:00 midnight and 4:00 a.m. Linux virtual servers will not be available during this backup window.
- Critical security patches requiring short notice.

Specific objectives are listed in this section regarding the total amount of time the DTS guarantees the system to be available within those hours. This guarantee pertains to those system components covered under this service offering only. The "down time" of any components covered under this service offering that become inoperable during guaranteed hours counts against the DTS system availability guarantee. If any other components necessary for delivery of this service that are not included in this service offering become inoperable during guaranteed hours and the DTS covered components remain operable, that "down-time" does not count against the DTS system availability guarantee. For example:

- DTS Outage – Any DTS application server or OS malfunction that does not allow the end user to access their system or send and receive information counts as an unplanned outage for the DTS. The entire time that the system is unavailable counts against the DTS's system availability for that month.

- Customer Outage – If the customer's LAN goes down and the end user cannot access the system, the entire time that the LAN is down does not count against the DTS's system availability for that month.

The DTS's service objective for system availability is 99% availability during normal hours of operation and 95% system availability during off-hours of operation.

Incident Tracking and Resolution

The DTS opens incident tickets and provides feedback as documented in Appendix B.

Data Backup and Disaster Recovery

The DTS performs the necessary system backups for the Linux environment in order to guarantee both the integrity of the customer's data, as well as the DTS's ability to recover that data as needed (see Operational Recovery below). The DTS retains 31 days of system backups using weekly full backups and daily incremental backups.

Note: At this time, backups are restricted to the VM minidisk level. This equates to the volume group level within Linux. File level backup/recovery is not available at this time.

Individual Linux server backups prior to any system or application maintenance procedure may be requested if daily backups are not adequate.

Operational Recovery

The DTS responds to system failures within two hours during normal operating hours.

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Reporting Requirements

Monthly Reports

The DTS provides availability and performance reports as indicated in the table, below. These reports will be made available on the DTS Internet. The information contained in the report reflects the past 30 days as well as provides data from previous months for trend analysis. Other service reports can be generated as agreed upon between the customer and DTS.

Metrics	Calculation or Information to be Provided
System Availability (Normal Hours): -- Guaranteed hours	 # of work days in month * 10
-- Unscheduled hours	Actual downtime
-- Actual hours	Guaranteed hours – Unscheduled hours
-- Percentage Available	Actual hours / Guaranteed hours * 100
System Availability (Off-Hours); -- Guaranteed hours	 # of work days in month * 14 + # of non-work days * 24 – preventative maintenance hours
-- Unscheduled hours	Actual downtime
-- Actual hours	Guaranteed hours – Unscheduled hours
-- Percentage Available	Actual hours / Guaranteed hours * 100
Data & Operational Recovery:	Detailed information regarding system/file recovery from backup
Outage Information: -- Linux Systems	 Detailed information regarding Linux system outages. Information includes: up and down times, hardware/software failure point, and resolution (this information is contained in help desk problem tickets)

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Pricing

Basic Service Offering Pricing

Server Categories:	Monthly Rate
1. Linux base server	$1,565
2. Linux web/LAMP server (Apache, MySQL, PHP)	$1,925
3. Application development server (Websphere)	$2,087
4. Database server (DB2 or Oracle)	$2,403

Options

1. Enterprise storage	$30 / GB / month
2. Additional processing power	$735 / 2% / month

Notes

1. Linux servers are based on a processor limit of 2% of the total processing capability of the Linux complex.
2. Each Linux server comes with 5 GB of external storage included.
3. Linux servers may be added or deleted in monthly processing intervals with 30 days advanced notice to DTS.

**** Please verify the most current rates on the** DTS **Web site:**
http://www.hhsdc.ca.gov/rates.asp

Pricing Worksheet Cost Estimate

Cost estimates based on these rates are developed as requested.

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Termination of the Service Offering

Both the HH DTS and the customer agree to deal in good faith with one another and to attempt problem resolution at the lowest appropriate level. Either party reserves the right to terminate the contract for this service offering if economic studies indicate there are lower cost alternatives, if the costs are determined to be unreasonable or unnecessary, if funding is not available, or if the service consistently fails to meet the service objectives listed in the service offering documentation.

A written termination notice is required 30 days in advance of the proposed termination date. The DTS cannot be held liable for liquidated damages for breach of the service level objectives contained within the service offering documentation.

Upon termination or other expiration of this service offering, each party will take all reasonable action to assist the other party in the orderly termination and transition process. In the event that the customer terminates the contract for service offering, the customer must pay the DTS forthwith for all work performed up to the date of termination and for any expense incurred by the DTS directly attributable to providing and terminating the service offering.

Appendix A

Definition Statements

Distribution

A common grouping of software, including an operating system and related utilities that are packaged and maintained by a single support group.

Enterprise Storage

Enterprise storage is a centralized repository for business information that provides common data management and protection, as well as data sharing functions, through connections to numerous (and possibly dissimilar) computer systems.

First Level Help

First level help is the initial contact point that computer system end users call when they need assistance with a software application, computer hardware, or other problem. In relation to DTS service offerings, the first level help is usually the DTS customer's own help desk.

Halon

Any of several halocarbons used as fire-extinguishing agents. Halon is used in computing environments because it causes less damage to electronic equipment than other fire-extinguishing agents.

LAN

A local area network (LAN) is a group of computers and associated devices that share common communications line(s) and typically share the resources of one or more servers within a small geographic area (for example, within an office building). Usually, the server(s) contain(s) applications and data storage that are shared in common by multiple computer users.

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Operating System

An operating system (often abbreviated as "OS") is the program that, after being initially loaded into a computer by a startup program, manages all the other programs in a computer. The other programs are called applications or application programs. The application programs make use of the operating system by making requests for services through a defined application program interface (API). In

addition, users can interact directly with the operating system through a user interface such as a command language or a graphical user interface (GUI).

Second Level Help

Second level help is the contact point that an DTS customer's Help Desk (First Level Help) calls when they need assistance with an incident that they have determined is the responsibility of the DTS. At the DTS, the second level help is usually the DTS Service Desk.

Third Level Help

Third level help is the contact point that the DTS Service Desk(Second Level Help) calls when they need assistance resolving an incident that they have determined is the responsibility of a particular DTS service area.

Uninterruptible Power Supply

An uninterruptible power supply (UPS) is a device that allows a computer or computers to keep running for at least a short time when the primary power source is lost. It also provides protection from power surges.

A UPS contains a battery that "kicks in" when the device senses a loss of power from the primary source. A UPS allows for time to save any data being worked on and exit gracefully before the secondary power source (the battery) runs out. When power surges occur, a UPS intercepts the surge so that it doesn't damage the computer(s).

Appendix B

Service Desk Severity Code Definitions

The matrix shown below contains the definitions of each severity code and the required response times for accepting trouble tickets and providing customer feedback during problem resolution.

SEVERITY CODE	DESCRIPTION	RESPONSE TIMES
Severity One (HOT)	Severe impact to site. For example: a system is down or a high percentage of end users have no access to an application.	The Service Desk accepts or refers ticket back to Customer Help Desk within 15 minutes. Technician working issue updates ticket every two hours.
Severity Two (HIGH)	Operations continuing but greatly degraded with multiple users affected. For example: degradation of critical application, intermittent network problem, and intermittent file server problem.	The Service Desk accepts or refers back ticket within 30 minutes. Technician working issue updates ticket daily.
Severity Three (NORMAL)	Operations affected less than once a week; single user affected. For example: problems that degrade but do not prevent accessibility/usability; workstation outage with other workstations available; degradation of non-critical application.	The Service Desl accepts or refers back ticket within one hour. Technician working issue updates ticket every two days.